REMARKS

The allowance of claims 9-14 and the conditional allowability of claims 4 and 6-8 are noted with thanks. However, it is believed that all of the pending claims are allowable over this art.

Claims 1 and 5 have been amended to more clearly and precisely define the present invention.

In the Office Action mailed September 8, 2005, the Examiner rejected claims 1 to 3 and 5 under 35 USC §103(a) as being unpatentable over Ernest et al. (USPN 4,827,348) in view of the newly cited U.S. Patent to Berezin (USPN 6,603,513). This rejection is respectfully traversed.

The present invention as defined by method claim 1 and apparatus claim 5 is directed specifically to the resetting of an array of **active pixel sensors** in a novel manner in order to avoid the problem of latch-up caused by driving substantial amounts of charge at one time onto the array substrate. The array **reset cycle,** in accordance with the present invention, includes **two steps**. In the **first** step, the **active pixel sensors** are divided into predetermined groups of one or more sensors and a pre-reset voltage is sequentially applied to the groups, resulting in a series of small charges to be driven onto the array substrate rather than a large charge. Once all of the **active pixel sensors** have been **pre-reset** in this manner, the **second subsequent** step of the reset cycle comprises applying a predetermined voltage to all of the sensors substantially simultaneously thereby assuring that all of the **active pixel sensors** are **reset** to substantially the same level. However, once again, this **second** step only results in a small charge to be driven onto the array substrate since the **active pixel sensors** have already been set to a level near the final level.

HAYES SOLOWAY P.C.
3450 E. SUNRISE DRIVE
SUITE 140
TUCSON, AZ 85718
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

It is to be noted that the term "substantially simultaneously" in the second step of claim 1 and in the second element of claim 5, means that, in the second step, the predetermined reset voltage is applied to all of the sensors at the same time and does **not** mean that the first and the second steps occur at the same time.

The Examiner argues in paragraph 3 that Ernest discloses a method of resetting an array of CCD's comprising:

(a) pre-resetting the sensors in the array by sequentially applying a pre-reset voltage to each predetermined group; and

(b) subsequently resetting the sensors by applying a predetermined reset voltage to all of the sensors.

Applicants respectfully submit that the above is a misinterpretation of the teachings of the primary reference, Ernest et al. What Ernest actually basically teaches that, in **one mode** (video) of operation, the fields A and B of sensors are read and reset sequentially and that in **another completely independent mode** (still) of operation, all of the sensors are read and reset simultaneously. In other words, Ernest et al teaches the use of step (a) **or** (b) and **not** the use of steps (a) **and** (b).

Ernest et al is directed towards a method and apparatus for exposure control in an electronic camera that utilizes CCD's and that is capable of converting between **two different and independent modes of operation**, namely a video mode and a still mode. The Ernest et al camera includes the use of an electronic shutter operation in video mode, and the use of a mechanical shutter in still mode. In the background of the invention, Ernest et al discusses an electronic shutter technique for CCD's for a video readout that is known in the art , "In the video mode of operation the length of time during which each of a Field A and a Field B is

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3450 E. SUNRISE DRIVE
SUITE 140
TUCSON, AZ 85718
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

integrated or exposed to image light is controlled electronically without a mechanical shutter mechanism by alternately integrating and discharging or reading out the respective two fields in synchronism with timing control supplied by a CCD Clock." Column 1, Lines 19 – 25. Subsequently, an electronic shutter can also be used in a still mode, as is further discussed, "Moreover, the same electronic shutter operation may be used when the camera is switched to a still mode of operation by clearing the CCD (again in synchronism with CCD Clock timing), integrating the CCD to the desired still image and terminating CCD exposure by readout. In this connection, it is to be noted that the still mode of operating employs a different method of CCD signal formation and read-out than the video mode but the exposure sequence for both is as depicted in Figure 1 of the drawings." Column 1, Lines 28 –37. In Figure 1, a prior art timing diagram of the differences between a video image capture and a still image capture is shown.

Ernest et al further teaches these two modes as separate modes that a CCD image sensor can be placed in. This is shown in Figure 1, where the "still" mode is activated by the "still switch on" signal, which subsequently clears the CCD (or resets) by activating the "clear CCD" signal. Ernest et al does not teach the use of a pre-reset before the subsequent reset shown as the activation of the "clear CCD" signal, but merely shows the process of the two modes as an electronic shutter.

It is not seen that the newly cited U.S. Patent to Berezin supplies the missing teachings to Ernest et al. to achieve or render obvious independent claims 1 and 5 or any of the claims that depend thereon. The Examiner states in paragraph 3 that Berezin discloses an APS sensor that acts as a single stage CCD and a method for pre-resetting (RESET N) and RESET N+1 as resetting for each row of sensors. The Examiner further states that "it would be obvious . . . to

HAYES SOLOWAY P.C.
3450 E. SUNRISE DRIVE
SUITE 140
TUCSON, AZ 85718
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

have been motivated to have used the process of pre-setting and simultaneously resetting as taught by Ernest...." However, it is clear from the discussion above that present claims 1 and 5 do not define a method or an apparatus for pre-resetting and resetting simultaneously, and also that Ernest teaches the processes as being two different and separate modes of operation. The Examiner continues by saying that the Ernest process can be applied "to an APS as well as a CCD sensor as disclosed in Berezin in order to reduce the number of control lines resulting in greater space resolution and higher quantum efficiency."

It is respectfully submitted that Berezin's RESET N signal is not a pre-resetting signal, but is a resetting signal for Row N. Further RESET N+1 is a reset signal for row N+1, therefore these two signals do not operate on the same sensors as reset signals. This is made clear in column 3, line 33 which states that figure 5 shows the reset "for two adjacent rows of sensors", one being the N row and the other being the N+1 row.

Further the present invention as defined by claims 1 and 5 is directed to the problem of latch-up created by the rapid acquiring of charge in the substrate, a problem which neither Ernest et al or Berezin address, which is not unexpected since this is not a problem in a CCD based image sensor.

The Examiner is therefore respectfully requested to withdraw his rejection of claims 1 to 3 and 5 under 35 USC 103(a) as being unpatentable over Ernest et al in view of Berezin.

In view of the above remarks, and having dealt with all of the matters raised by the Examiner. Early and favorable reconsideration of the application is respectfully requested.

HAYES SOLOWAY P.C.
3450 E. SUNRISE DRIVE
SUITE 140
TUCSON, AZ 85718
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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Respectfully submitted,

Norman P. Soloway
Attorney for Applicants
Reg. No. 24,315

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By M. Diane Dubé

NPS:dd

HAYES SOLOWAY P.C.
3450 E. SUNRISE DRIVE
SUITE 140
TUCSON, AZ 85718
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567